

***Nautilina calyptogenicola*, a New Genus and Species of Parasitic
Polychaete on a Vesicomysid Bivalve from the Japan Trench,
Representative of a New Family Nautilinidae**

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ABSTRACT—A polychaete species was found in the mantle cavity of the giant deep-sea clam, *Calyptogena phaseoliformis* collected from the cold-seep zone of the Japan Trench at a depth of 5960 m. Although the new species recalls species of the families Levidoridae and Calamyzidae in the simplified body, the presence of subbiramous parapodia and the absence of achaetous peristomial rings in the new species lead us to propose the erection of a new family. *Nautilina calyptogenicola*, a new genus and species, is described as a representative of a new family Nautilinidae.

INTRODUCTION

An aberrant polychaete species was found in the mantle cavity of the giant deep-sea clam, *Calyptogena phaseoliformis* Métivier *et al.* 1986 [1], collected from the landward wall of the Japan Trench at a depth of 5960 m by the French submersible "Nautil" in the course of the French-Japanese project KAIKO [2]. This species has a simplified body with similar body segments and resembles that of the family Calamyzidae Hartmann-Schröder, 1971 [3], a parasitic worm on ampharetid polychaetes, and that of the Levidoridae Perkins, 1987 [4], but is not thought to belong to these families particularly due to the differences in the cephalic region and the parapodia. In consequence of the comparison of this species with those of other polychaete families, the erection of a new family is proposed in this study.

The types are deposited in the Muséum National d'Histoire Naturelle, Paris (MNHN) and the National Science Museum, Tokyo (NSMT).

Nautilinidae, new family

Type genus: *Nautilina*, new genus, with type species *N. calyptogenicola*, new species, by monotype.

Diagnosis: Body long, vermiform, tapering posteriorly with numerous setigerous segments; body in cross-section flattened ventrally and strongly arched dorsally. Segmentation distinct. Prostomium with 2 pairs of antennae, without eyes. Foregut with muscular proventriculus. Achaetous peristomial ring absent. All segments setigerous. Buccal opening situated between prostomium and first setiger. Parapodia of one type, subbiramous with reduced notopodia and well developed neuropodia supported by a single neuroacicula. Setae consisting of simple, smooth and slightly curved hooks. Pygidium simple and cylindrical without appendages.

Remarks: *Calamyzas amphictenicola* Arwidson, 1932 [5], still known as the single species of the family Calamyzidae and ectoparasitic on ampharetid polychaetes [6], resembles the species of the new family in the cross-section of the body and the parapodial structure. The resemblance of the two families may be due to a convergence in the ectoparasitic life. *C. amphictenicola* lacks prostomial antennae and has compound setae,

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while *Nautilina calyptogenicola* g. sp. n. bears 4 prostomial antennae and has simple setae. The species of the Levidoridae also resembles *N. calyptogenicola* g. sp. n. in having a similar foregut with a muscular proventriculus and a semi-circular cross-section of the body. However, *N. calyptogenicola* g. sp. n. lacks the achaetous peristomial rings which are characteristic for a species of the Levidoridae. The new family is also characterized by the presence of 2 pairs of prostomial antennae and the absence of eyes instead of the exclusive presence of 2 pairs of eyes in the Levidoridae (including one pair of lensed eyes recalling those of Syllidae). The setal structure is also different in these two families. The setae of the new family are simple and unidentate without any sculptures on their surface, while those of Levidoridae are sometimes bidentate with serrations on subterminal ends.

Although families such as Spintheridae, Acrocirridae, Sphaerodoridae and Pilargidae contain species with strongly curved hooks [7], their hooks are compound in their structure when neuropodial or are positioned on the notopodia and differ from those of the new family, which are simple ventral hooks.

The presence of a muscular proventriculus in the new family suggests close relationship with the Syllidae, as in the case of the Levidoridae [4]. However, the absence of achaetous peristomial rings and the possession of the subbiramous parapodia in *N. calyptogenicola* g. sp. n. are negative for the close relationship between these families. The 4 prostomial antennae and the subbiramous structure of parapodia of the new family may be important and significant characters to elucidate the phylogenetic relation with other polychaete families, especially with those of the order Phyllodocida. Further discussion on the taxonomical position of the new family should be retaken after the finding of more species belonging to this family.

Nautilina, new genus

Diagnosis: Body flattened ventrally and strongly arched dorsally. Prostomium globular with 2 pairs of antennae, without eyes. Muscular proventricu-

lus present. Peristomium inconspicuous; achaetous peristomial ring absent. Parapodia subbiramous with dorsal and ventral cirri; notopodium supported by a single notoaciculum within swollen base of dorsal cirrus; neuropodium with a single neuroaciculum. Single projected hook and several developing embedded hooks present on each setal lobe. Pygidium simple and cylindrical.

Etymology: The genus is named in the honor of the French submersible "Nautil" which collected the bivalve host of that parasitic polychaete during KAICO expedition phase 2 in July, 1985.

Nautilina calyptogenicola, new species (Fig. 1)

Materials: Holotype (MNHN UC86), complete, separated in 3 pieces, Landward wall of the Japan Trench, 40°06.3'N, 144°10.6'E, 5960 m, 31 July 1985, French submersible "Nautil" Dive KD-18, collected from the mantle cavity of *Calyptogena phaseoliformis*.

Paratypes (NSMT-Pol. P-251), a complete specimen separated in 2 pieces, an anterior and a posterior fragment, Japan Trench, 35°54.2'N, 142°30.7'E, 5640–5695 m, 22 July 1985, Dive KD-14, collected with *C. phaseoliformis*.

Measurements: Holotype separated in 3 parts, 20 mm long (7.4+8.4+4.2 mm), 2.4 mm wide including parapodia, with 68 setigers (22+25+21). Complete paratype separated in 2 parts, 32.4 mm long (22.0+10.4 mm), 4.2 mm wide, with 62 setigers (35+27).

Description: Body long, vermiform, flattened ventrally and strongly arched dorsally, with ventral longitudinal groove (Fig. 1a, e). Integument smooth. Specimens preserved in alcohol pale or colorless.

Prostomium globular with antero- and posteroventral pairs of very short cirreiform antennae, without eyes or other appendages (Fig. 1b, c). Achaetous peristomial ring absent. Mouth opening situated between prostomium and first setiger, with one rounded posterior and two rectangular buccal peristomial lobes (maybe eversible), without jaws or paragnaths (Fig. 1c). Foregut with well-developed muscular part (maybe proventriculus), without tubiform chiti-

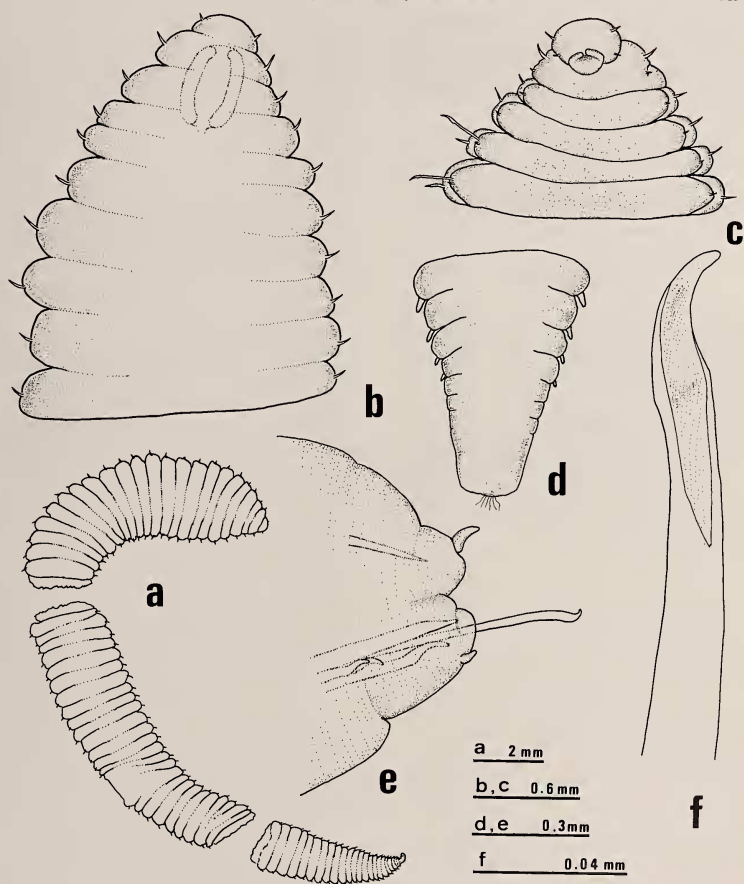


FIG. 1. *Nautilina calyptogenicola* g. sp. n. (holotype): a, Whole body, dorsal view; b, Anterior end, dorsal view; c, Same, ventral view; d, Pygidium, dorsal view; e, Parapodium 10, anterior, view; f, Hook.

nous pharynx.

Parapodia subbiramous throughout body, with dorsal and ventral cirri; dorsal cirri more than 3 times as long as ventral one; bases of dorsal cirri swollen, forming globular pads containing embed-

ded notoacacula; ventral cirri present on ventral bases of setal lobes, supported by stout embedded neuroacacula; setal lobes globular, of same size as dorsal pads (Fig. 1e).

Setae consisting of simple ventral hooks only;

single hook projected from each setal lobe; several developing hooks embedded around neuroacacula. Hooks simple, stout and strongly curved on distal end; cortex and medulla well defined on distal half (Fig. 1f).

Pygidium cylindrical with anus on distal end, without anal cirri (Fig. 1d).

Etymology: The specific name is derived from the generic name, *Calypptogena*, of the host bivalve species.

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